

Attorney's Docket No. K&A 23-0276

APPLICATION

FOR UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **RICHARD H. TILTON**, a citizen of UNITED STATES OF AMERICA, have invented a new and useful **HYDRAULIC PRESS** of which the following is a specification:

HYDRAULIC PRESS

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BACKGROUND OF THE INVENTION

Field of the Invention

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The present invention relates to multi-purpose metal working machines and more particularly pertains to a new hydraulic press for working a variety of metals and metal products.

15 Description of the Prior Art

The use of multi-purpose metal working machines is known in the prior art. Illustrative examples include U.S. Patent No.

3,140,634; U.S. Patent No. 3,678,724; U.S. Patent No. 3,710,665;

20 U.S. Patent No. 3,701,276; U.S. Patent No. 4,531,439; U.S. Patent

No. 4,576,380; U.S. Patent No. 5,598,737; U.S. Patent No.

4,348,943; U.S. Patent No. 3,735,627; U.S. Patent No. 4,741,084;

U.S. Patent No. 3,866,522; U.S. Patent No. 5,575,186; and U.S.

Patent No. 3,468,206. Other examples include Scotchman models

25 5014-TM and PortaFab-45.

While these devices fulfill their respective, particular objectives and requirements, the need remains for a machine that utilizes an offset pivot arm to drive both a punch assembly and a 30 press assembly.

SUMMARY OF THE INVENTION

The present invention meets the needs presented above by providing an integrated machine with shear, press, and punch 5 capabilities driven off of a common hydraulic cylinder through a single arm member.

An advantage of the present invention is to provide a new hydraulic press that used a ram member coupled to a medial portion 10 of the arm member to provide a 50 ton capability press through the force of the hydraulic cylinder and leverage of the arm member.

Another advantage of the present invention is to provide a new hydraulic press that utilizes an offset pivot point to increase 15 the leverage through the arm member to provide an 80 ton capability punch coupled to a second end of the arm member.

Still yet another advantage of the present invention is compatibility with a wide variety of standard punch and press dies 20 without intermediate adapters or modules.

To this end, the present invention generally comprises a frame member designed for resting upon a horizontal support surface and having at least two vertical stanchions with a horizontal support 25 member extending between the vertical stanchions and being positioned adjacent a top end of each of the vertical stanchions; an arm member pivotally coupled to the frame member; and a hydraulic cylinder having a piston selectively extendable from the hydraulic cylinder, the hydraulic cylinder being operationally coupled to the frame member and the piston being operationally coupled to the arm member whereby extension of the piston from the hydraulic cylinder 30

pivotaly moves a first end of arm member away from the frame member.

There has thus been outlined, rather broadly, the more
5 important features of the invention in order that the detailed
description thereof that follows may be better understood, and in
order that the present contribution to the art may be better
appreciated. There are additional features of the invention that
will be described hereinafter and which will form the subject matter
10 of the claims appended hereto.

The objects of the invention, along with the various features
of novelty which characterize the invention, are pointed out with
particularity in the claims annexed to and forming a part of this
15 disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than
20 those set forth above will become apparent when consideration is
given to the following detailed description thereof. Such
description makes reference to the annexed drawings wherein:

Figure 1 is a schematic perspective view of a new hydraulic
25 press according to the present invention.

Figure 2 is a schematic front view of the present invention.

Figure 3 is a schematic side view of the present invention.

30 Figure 4 is a schematic perspective view of the punch
assembly of the present invention.

Figure 5 is a schematic perspective view of the press assembly of the present invention.

Figure 6 is a schematic front view of the shear blade of the
5 present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

10 With reference now to the drawings, and in particular to Figures 1 through 6 thereof, a new hydraulic press embodying the principles and concepts of the present invention and generally designated by the reference numeral 10 will be described.

15 As best illustrated in Figures 1 through 6, the hydraulic press 10 generally comprises a frame member 20, an arm member 30, a hydraulic cylinder 40, a shear blade 50, a press assembly 65, and a punch assembly 70.

20 The frame member 20 is designed for resting upon a horizontal support surface. Preferably, the frame member 20 has at least two vertical stanchions 21 and a horizontal support member 22 extending between the vertical stanchions 21. The horizontal support member 22 is preferably positioned adjacent a top end of
25 each of the vertical stanchions 21.

The arm member 30 is pivotally coupled to the frame member 20. The hydraulic cylinder 40 has a piston 41 selectively extendable from the hydraulic cylinder 40. The hydraulic cylinder 30 40 is operationally coupled to the frame member 20. The piston 41 is operationally coupled to the arm member 30. Thus, extension of

the piston 41 from the hydraulic cylinder 40 pivotally moves the first end 33 of arm member 30 away from the frame member 20.

5 A hydraulic reservoir 42 may be operationally coupled to the hydraulic cylinder 40 for providing additional hydraulic force.

The control assembly 44 is operationally coupled to the hydraulic cylinder 40 for selectively actuating the hydraulic cylinder 40 and extending the piston 41.

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The shear blade 50 is operationally coupled to a lower portion of the arm member 30 for cutting metal when the piston 41 is retracted into the hydraulic cylinder 40.

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Preferably, the arm member 30 has a pivot portion 35 pivotally coupled to the frame member 20, a first extent 31 extending outwardly from the pivot portion 35 terminating at the first end 33 of the arm member 30. Similarly, the arm member 30 also has a second extent 32 extending outwardly from the pivot portion 35 opposite the first extent 31 and ending at the second end 34. The first extent 34 is substantially longer than the second extent 32 to improve leverage of the piston 41 for applying downwardly directed force at the second end 34.

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Most preferably, the first extent 31 has a length at least three times as long as a length of the second extent 32.

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In an embodiment, the punch assembly 70 is operationally coupled to the second end 34 of the arm member 30. A punch mating assembly 75 is operationally coupled to the frame member

20 and aligned with the punch assembly 70. The punch assembly 70 engages the punch mating assembly 75 when the first end 33 of the arm member 30 is moved away from the frame assembly 20 by the piston 41.

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In a further embodiment, the punch assembly 70 engages the punch mating assembly 75 with eighty tons of force.

10 In yet a further embodiment, the press assembly 60 includes a ram member 65, which is operationally coupled to a medial portion of the arm member 30. The ram member 65 extends downward from the arm member 30 for transferring a force from the arm member 30 to a piece of metal being worked.

15 A second horizontal support member 23 may be operationally coupled between the two vertical stanchions 21. The second horizontal support member 23 is preferably positionable below the horizontal support member 22, for supporting the piece of metal being worked. The ram member 65 is most preferably positioned at 20 a medial portion of the first extent 31 of said arm member 30. A first plurality of apertures 24 extends through a first one of the two vertical stanchions 21, and are dispersed in a linear array. Similarly, a second plurality of apertures 25 extends through a 25 second one of the two vertical stanchions 21. The second plurality of apertures 25 is also dispersed in a linear array. A pair of coupling members 26 are provided for operationally coupling the second horizontal support member 23 to the two vertical stanchions 21. Each one of the pair of coupling members 26 is positionable through a selected pairing of one of the first plurality of apertures 30 24 and one of the second plurality of apertures 25 whereby a height

between the ram member 65 and the second horizontal support 23 is adjustable.

In yet a further embodiment, the ram member 65 develops
5 fifty tons of force.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form,
10 function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

15 Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction
20 and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.